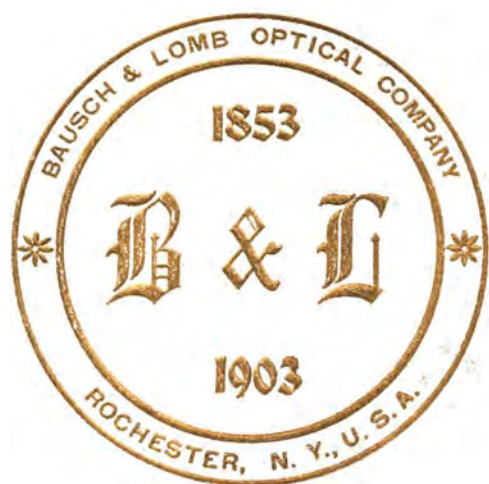




Souvenir

COMMEMORATING THE SEMI-
CENTENNIAL ANNIVERSARY
OF THE ASSOCIATION OF
MR. J. J. BAUSCH AND
MR. HENRY LOMB AND
THE FOUNDING OF
THE BAUSCH &
LOMB OPTICAL
COMPANY

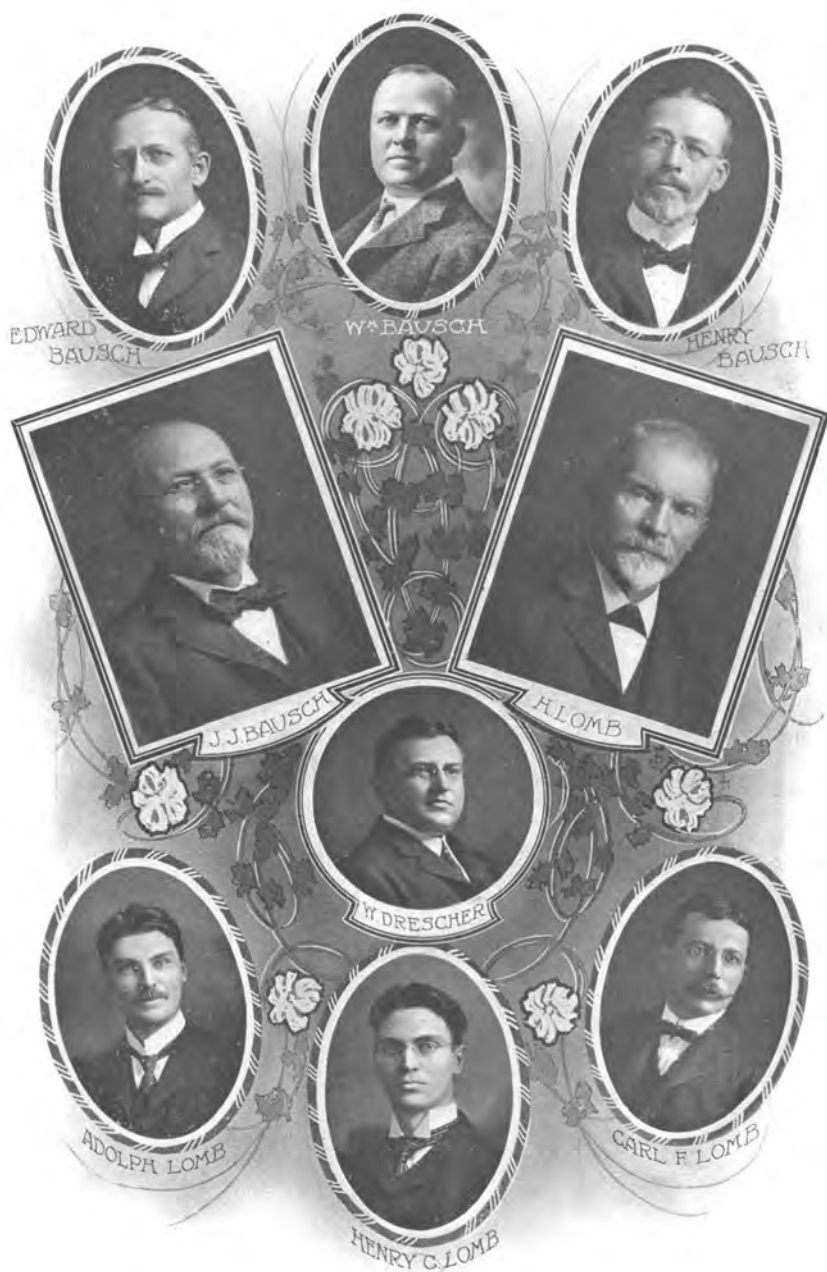
By L. B. ELLIOTT



ROCHESTER, N. Y.

JULY TWENTY-FIFTH

1853 - 1903



Active Members of The Bausch & Lomb Optical Company, 1903.



THE story of the Bausch & Lomb Optical Company is the story of the humble beginning of two earnest workers whose untiring energy and unremitting devotion to a single purpose, coupled with the united efforts of their combined families, has overcome their lack of capital and the many obstacles which beset the manufacturer in the pioneer days of our country, has guided the energies entrusted to them along higher and higher planes of activity and usefulness, until today what was fifty years ago the workshop of two ambitious and fearless young men is a manufacturing enterprise occupying buildings having 190,000 feet of floor space, employing 1200 workmen, and producing almost every variety of optical instrument.

Mr. J. J. Bausch, the senior member of the young firm, was born in the town of Suessen, Wuertemberg, Germany, on the 25th day of July, 1830. His early life was spent in the employ of his brother, a maker of and dealer in optical instruments. The spirit of enterprise and energy, which has characterized his whole business career, early asserted itself, as is shown by his arrival in America with the sturdy pioneers of '49.

America did not then hold out many prospects to a young optician, and he consequently found it necessary to turn his attention to other pursuits for a time, taking up the trade of wood-turning, at which he worked in the cities of Buffalo and Rochester, until 1852, when an accident caused the loss of two fingers of his right hand.

This accident was an important event in Mr. Bausch's life, as it prevented his continuing in the wood-turning trade and turned his thoughts again to his first love—the making of optical appliances, although he was not able at first to engage directly in optical work. He having been interested in Daguerre's photographic process from its first invention, bought a photographic studio in the city of Rochester, and with Mr. Lomb conducted a Daguerreotype parlor for a short time.

At this point we will digress a moment to speak of the early life of Mr. Henry Lomb who became associated with Mr. Bausch in July, 1853. Mr. Lomb was born in Burghaun, Hesse-Kassel, Germany, November 24, 1828, and came to America when he was twenty

years old. Landing in New York, 1849, he went direct to Rochester. Having learned cabinet making in Germany, he followed this avocation in Rochester, when there was work in this line to be done, until the date of his association with Mr. Bausch in the optical business.

In order that subsequent developments in optical manufacture may be better understood, let us consider a moment the condition of the optical trade of the world in 1853. Eyeglasses and spectacles, while they had been in use for many years, were crude affairs with



MR. J. J. BAUSCH
At 24 years of age.



MR. HENRY LOMB
At 26 years of age.
From a Daguerreotype made by Mr. Bausch.

horn, gold, or German silver frames. The lenses were of indifferent accuracy, ground mostly by hand and with comparatively few foci at the disposal of opticians. Eyeglasses were all made with horn or metal frames, the modern rimless eyeglass being unknown. Even the nosepiece which today seems so indispensable was lacking.

There were no lenses made in America and but few spectacle or eyeglass frames. Microscopes were still regarded largely as toys and were not generally used in the scientific work of our educational institutions as they are to-day, in fact there were no science courses to employ them. The same can be said of the microtome, the projection lantern, and many other appliances which are now used in large quantities. Photography was in its infancy, and the amateur picture making outfits which are so common a feature of today were undreamed of. It is needless to say, photographic lenses or shutters were not made in this country at this time, except perhaps in an experimental way. The manufacture of field glasses in America is of so recent a date that it hardly needs mention.

The pioneer life of the people did not demand the eye strain and consequent use of spectacles and eye-glasses of the present day, and the difficulty of obtaining them, and their unfashionableness still further deterred the general public from making use of optical improvements.

Thus it was that when Mr. Bausch opened his first office in the Reynolds Arcade, a structure which is still one of the land-



Bausch & Lomb's store, 20 Arcade, 1853.

marks of Rochester, sharing the small space with a cobbler whose wares were displayed alongside the optical goods, the sale of a pair of spectacles was an event of some consequence in the community.

Mr. Bausch's efforts at establishing an optical business in his first office in the gallery of the Arcade was for several years so barren of results that he was many times on the point of giving up the attempt. He was located in this office in 1853, the date of his association with Mr. Lomb. He persevered, however, and soon engaged a more favorable location on the ground floor of the Arcade, where he began to grind on a crude hand machine the first spectacle lenses which were ever made in America, and where Messrs. Bausch & Lomb continued their business until their removal to the Andrews Street factory.

The association of Messrs. Bausch & Lomb brought together the optical experience of Mr. Bausch, together with his stock of



J. J. Bausch & Co.,
OPTICAL INSTITUTE,
 No. 20 Arcade, Rochester, N. Y.
(opp. the Post-Office)

Respectfully announce to the public generally, that they have a large
 assortment of

S P E C T A C L E S ,
 OF EVERY DESCRIPTION,
 with glasses scientifically ground, and of the best material,
 suitable for long, short, or otherwise impaired sight.

IN GOLD, SILVER AND STEEL
MOUNTINGS.

In selecting Spectacles, especially at first, too much care cannot be bestowed
 by persons unacquainted with the precise power of lenses adapted to their state
 of vision.

THE GIFT OF SIGHT IS INESTIMABLE.
 Nothing should be neglected to preserve it.
 Thousands who could have enjoyed excellent sight, are suffering from
 damaged vision, caused by the use of improper glasses or the ignorance of
 optician's art.

J. J. Bausch & Co.
 being in possession of unexcused glasses and the positive
PEBBLE (ROCK CRYSTAL) LENSES,
 which for their clearness, hardness and beneficial results the value are acknowledged by doctors
 and known as the best in use, and superior to any glasses from whatever place they may come,
 and having had much practical experience in optical matters, they can confidently assure the
 public, that their aim is to suit each eye, to supply spectacles as well as to be done, and to
 afford discount value, as far as it can be done by glasses.

From the great number of

TESTIMONIALS OF RECOMMENDATION
 they have received from eminent and scientific persons, they only mention some of the following
 highly esteemed gentlemen and other judges:

C. Dewey, M. D., D. D.	Th. Hall, M. D.
W. W. Ely, M. D.	D. Bly, M. D.
E. M. Moore, M. D.	N. S. Barnes, M. D.
H. W. Dean, M. D.	W. W. Roll, M. D.
D. Bartow, M. D.	J. B. Walker, M. D., Oculist.

They keep also on hand a fine assortment of
Telescopes, Microscopes, Compasses,
Magnifying Glasses, Magneto-Electric Machines, Barometers,
Thermometers, Drawing Instruments, &c.
 They will be to accommodate their customers in

and will be happy to supply all those who are in need of eye glasses.
 P. Please, preserve this circular until called for.

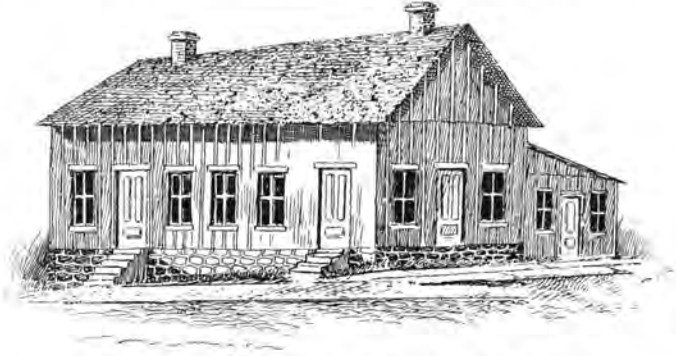
Hand-bill used in 1856.

The resources and volume of business of the new concern were not such that the two principals could draw their entire subsistence from it and both of them were forced at times to resort to their former means of livelihood to eke out the slender income.

During this period Mr. Lomb made many efforts to stimulate the sale of the goods, among the first being a series of trips to smaller towns in the vicinity of Rochester, the chief object of which was to fit spectacles to the eyes of the good people, and to supply them with microscopes, telescopes, magnifiers, etc. Mr. Bausch also made similar trips as occasion offered and means permitted.

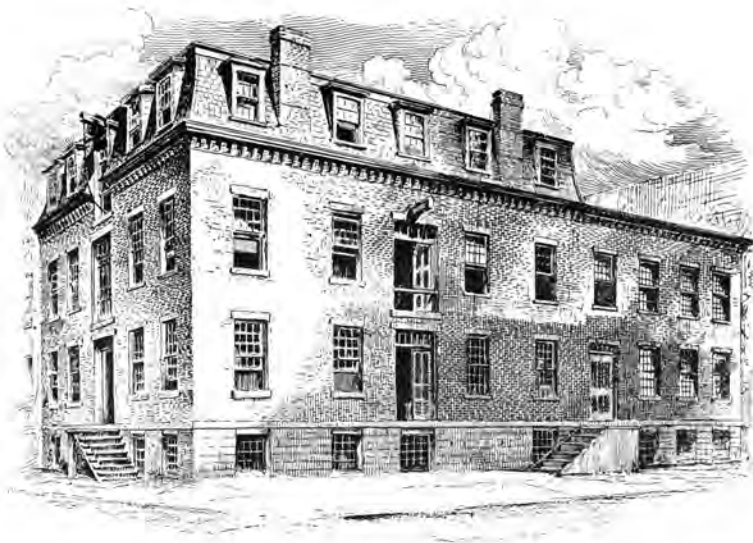
very small value, and the capital of Mr. Lomb, consisting of about \$60.00 in cash, but what was of far greater importance, an inexhaustible stock of energy and pluck, an unchangeable desire for improvement and a fixed determination to some day produce the highest types of optical instruments better than they had ever been made before. Even these traits would, as subsequent events proved, have availed but little without that perennial faith in the ultimate success of their undertakings which tided over many a dreary time.

These trips were announced in the local papers of each town, and hand-bills were distributed to the important citizens, telling where the representative of the Bausch Optical Institute could be found on a given day, the beginning of the use of the public prints



Bausch & Lomb's first factory, corner Andrews and Water Streets.

which has since become so important a factor in business development. It is interesting to note in the books of account of these dates that the total receipts for a day were as much as \$6.50.



Bausch & Lomb's second factory, River and Water Streets, 1868

Among those who lent their support and encouragement in those early days were Doctors C. Dewey, W. W. Ely, E. N. Morse, H. W. Dean, D. Barrows, Th. Hall, D. Bly, N. S. Barnes, W. W. Reid and J. B. Walker.



An early business card, about 1864.

At the outbreak of the Civil War in April, 1861, Mr. Lomb enlisted in Co. C, 13th N. Y. State Volunteers, was elected 1st Sergeant, afterwards advancing to Captain, and served with his regiment in the Vir-

ginia campaigns of the Army of the Potomac, until the expiration of the regiment's time of service, in May, 1863.

During this period Mr. Bausch continued the business alone, adding meanwhile several workmen as assistants in finishing the eyeglass frames which he prepared during the evening hours.



An early bill head, about 1864.

Mr. Bausch's efforts from the first were bent toward manufacturing the articles sold, and on making them better than they had ever been made before. The first manufactures were of horn eyeglass frames which were sawed out of sheets of horn imported from abroad, finished by hand, and set with lenses partly of foreign make, and partly with lenses ground in the shop.

The workmanship of these early eyeglasses attracted the attention of a New York dealer who chanced to see some of them, and he arranged to take all that could be turned out in addition to those required for local consumption. These he re-sold, and the source of supply of these goods was for some time entirely unknown to the trade.

Rochester, June 1, 1868

At

Sir

Referring you to the annexed Circular of the VULCANITE OPTICAL INSTRUMENT COMPANY, we respectfully inform you, that this day, the firm of BAUSCH & LOMB has been dissolved, and its business merged in that of the above named Company.

Having arranged our business affairs so that we can devote our whole time and attention to the business of the Company, we can assure our old friends that no effort will be spared on our side to make the transactions between them and the Company pleasant and advantageous. We solicit the confidence and favors, you have heretofore bestowed upon us, for the new Company.

Tendering you, Sir, our best thanks for the many favors and the kind and valuable assistance you have rendered us, and assuring you, that we will always duly appreciate them,

We are,

Very respectfully,

Your obedient servants,

BAUSCH & LOMB.

New-York, June 1, 1868

Sir

We beg to inform you, that we have this day formed a Company for the purpose of manufacturing Reiller Optical Instruments, under the name of

Vulcanite Optical Instrument Company,

and have opened a room for the sale of our goods, at No. 122 BROADWAY, corner John Street, Room No. 5.

Having obtained the exclusive right to manufacture, under the Gooden Patent, Eyeglasses and all other Optical Instruments having Round Reiller Frames, and possessing superior advantages for manufacturing, we are prepared to execute, with promptness and dispatch, all orders for goods on that line.

The business of the Company will be under the immediate management of Mr. J. J. BAUSCH, and Mr. HENRY LOMB, who, as manufacturers of Optical Instruments, under the firm name of BAUSCH & LOMB, Rochester, N. Y., have been long and favorably known to the public.

An Illustrated Price List of goods, manufactured by us, will be ready and sent to our customers on a few days.

All communications should be directed to

VULCANITE OPTICAL INSTRUMENT COMPANY,
122 BROADWAY, NEW-YORK.

Soliciting your kind press, and assuring you that we always shall endeavor to make the business relations between us agreeable and profitable to both parties, we are, Sir,

Very Respectfully, your obedient servants,

VULCANITE OPTICAL INSTRUMENT COMPANY,

Per H. LOMB, Selling Agent.

As soon as the manufacture of eyeglass frames began to be firmly established, it became necessary to have more workmen, and a building on the corner of Andrews and Water streets was taken in 1864. The demand for frames set with lenses increased and Mr. Bausch, deeming it desirable to manufacture all of the lenses used, constructed a power grinding and polishing machine which was the first power lens grinding plant in America. Here about twenty-eight workmen were employed. The limits of the Andrews Street building soon proved too small for the work. Another move was made to a building on the corner of River and Water Streets, in 1868, where two stories of the building were occupied by the lens grinding and frame, loupe, and other manufacturing work.

With this expansion Mr. J. B. Klingler, one of the first workmen engaged, was made

foreman and later on superintendent of the lens department and a director of the Company. He retired from active work in 1901.

Vulcanite Optical Instrument Co.,
MANUFACTURERS
UNDER GOODYEAR'S PATENT
OF

Optical Instruments,

No. 182 BROADWAY,

Room No. 5,

CORNER JOHN STREET,

NEW-YORK.

About this time, 1866, the retail store in the Arcade was disposed of, and is still in existence under the firm name of E. E. Bausch & Son.

The process of manufacture at this time was tedious and the results none too satisfactory. The first advance was due to the accidental finding on the

street of a piece of the then new material, vulcanite or hard rubber, by Mr. Bausch. He instantly recognized the applicability of this new substance to the making of eyeglass frames, and sought out the source of supply without success at first, for his first vulcanite eyeglass frames were sawed out of hard rubber scoops purchased for the purpose. Further efforts however led to the discovery of the manufacturer of vulcanite with the result that the India Rubber Comb Co. granted to Messrs. Bausch & Lomb the exclusive right to manufacture optical instruments of vulcanite, and the Vulcanite Optical Instrument Company was organized in 1866.

This was the beginning of real advancement, as the high price of gold made gold framed eyeglasses a luxury, and the vulcanite frames, being light and strong, were much preferred to the horn. It was not all clear sailing, however, as all the methods of manufacture had to be originated, and there was no one to make the proper tools or machinery, even if there had been the money to pay for them.

The vulcanite came from the makers in sheets and was at first sawed to shape by hand, as was the horn stock, the first advance being the heating of the sheet rubber to soften it, and then punching out the frames with punch and die. The primitive methods of this early work and the pluck required to bring it to a successful issue will be appreciated when it is known that the vulcanite sheets were at first softened upon the family cook stove, and the punching was done on a hand press, the feeding being done by Mr. Bausch, the lever being operated by Mr. Lomb. Mr. Edward Bausch being the eldest son, although then a mere child, was delegated to the care of the rubber during the softening

VULCANITE OPTICAL INSTRUMENT CO.
MANUFACTURERS OF

OPTICAL INSTRUMENTS

WITH

HARD RUBBER AND TORTOISE SHELL FRAMES,

NO. 182 BROADWAY,

Room No. 5,

CORNER JOHN ST.,

NEW YORK

process, and many were the difficulties his infantile lack of judgment in leaving the strip of rubber in the oven until it began to

burn, or in consuming a little too much time on the way from the stove to the punch, sometimes precipitated upon him, for the destruction of a few sheets of rubber was, in those days, a very serious financial embarrassment.



At the time of the incorporation of the Vulcanite

Optical Instrument Company, the Manufacturing Department was separated from the Sales Department, Mr. Bausch being made manufacturing agent, in charge of the manufactory at Rochester, Mr. Lomb being made sales agent, in charge of the Sales Department, which was removed to New York City, an office being opened at 182 Broadway, corner of John Street, in 1866, Mr. Lomb at this time taking up his residence in New York City.

It is impossible to dwell on the many interesting developments which took place in the old River Street building. Suffice it to say that the eyeglass was developed practically up to its present condition. Mr. Bausch invented and applied the first nosepiece to an eyeglass, and his samples made in the early sixties embody many principles which have since been applied in the construction of eyeglass frames, nosepieces, springs and guards. Loupes and magnifiers were also made here of vulcanite, and vulcanite loupes and magnifiers of the same form with the B. & L. trade-mark are still the favorites everywhere.

It is also of interest to note that here the first attempt to manufacture opera glasses in America was made, the material of the cases being vulcanite, which



speedily proved its unsuitableness for such a purpose. The manufacture was discontinued, and has not as yet been revived.

The Goodyear patents being about to expire, it was felt that,

while the rubber eyeglass business was in a prosperous and satisfactory condition, now was the time to carry out the plans which Messrs. Bausch & Lomb had cherished from the first—the manufacture of the highest types of optical instruments in America.

Mr. Bausch's son, Edward, having now completed his college course, was ready to assist in the higher development as was the second son, John, now deceased, and the younger brothers, Henry and William, followed soon after. Accordingly, the present site of the Bausch & Lomb Optical Co.'s works at St. Paul and Vincent Streets was purchased, and a brick building erected thereon which was occupied in 1874.



Bausch & Lomb's factory, St. Paul and Vincent Streets, 1874.

In 1875 the manufacture of microscopes was commenced under the supervision of Mr. E. Gundlach, one of the most advanced scientific opticians of his time who remained with the Company for the first two years, after the beginning of the experiments in the development of microscopes. In 1876 Mr. Carl F. Lomb became secretary of the Company, serving in that capacity until 1888, when he was succeeded by Mr. William Drescher, Mr. Lomb from this time forth turning his attention more especially to other enterprises in which he became interested. A year of hard work and experimentation was consumed in getting the first models of microscopes in satisfactory condition. These models were exhibited at the Centennial Exhibition at Philadelphia in 1876, and created a very favorable impresssion among the scientific men who examined them. There was a general desire among scientific and educational people

at this time to use the microscope as an accessory in teaching biological and other sciences, but the prices at which good microscopes could be had were prohibitive, in fact no attempt had been made by any of those engaged in the manufacture of microscopes



Bausch & Lomb's Exhibit at the Centennial, 1876.

to produce them in quantity, or at a reasonable figure. From the outset this had been one of the main purposes of the Bausch & Lomb Optical Company, and on this basis they received from the beginning of their efforts the hearty support of men of science in all parts of the country. Even with this support, the experiments were conducted with tremendous losses for many years, and had it not been for the prosperous condition of the eyeglass and lens part of the business, the attempts would have been disastrous in the extreme. The only thing which kept the Microscope Department of the business going was the indomitable resolve to accomplish the

purpose which had so long been cherished, to produce in America the highest quality of optical instruments, and to produce them in commercial quantities. While the balance sheet was going down, the quality of the work was steadily improving, which, of course, began to have its effect in the sales, and when the day finally came that the books showed no actual loss, there was great rejoicing.

The production of American microscopes of acceptable quality, and at moderate prices, seemed to have a very stimulating effect on their introduction for educational and industrial uses, as well as on their use by individuals as a means of recreation and culture. Here, as in all other lines of work, the battle against adverse conditions in manufacture was less strenuous than that which it was necessary to wage against the deep seated conviction in the public mind that optical work of high excellence could only be made in Europe, that American skill and ingenuity was unable to cope successfully with the problems presented in optical manufacture. The tide gradually turned, however, and the Bausch & Lomb products found their way over the length and breadth of the land wherever microscopes are used.

The full resources of the growing business were employed in the training of the most skilled workmen, in repeated journeys abroad to keep in touch with the rapid advances being made in the development of optical glasses, theoretical and applied optics and in optical invention.

Up to the time of the production of the dry-plate of marketable quality, no photographic lenses had been made in America, with the exception of a few portrait objectives, and those made abroad, intended for the use of the professional, were large, bulky and of great cost.

Messrs. Bausch & Lomb under the direction of Mr. Edward Bausch produced their first photographic lenses and offered them to American manufacturers at so reasonable a figure, that it became possible to manufacture cameras for amateur use at prices within reach of the public. The introduction of their photographic lenses was followed by the invention of the Iris Diaphragm Shutter. Up to this time photographic shutters were little used, and the introduction of the between-the-lens type of shutter marked another milestone in the advance of photography, for the simplification of the most difficult part of photography, the exposure, did a great deal to popularize it. Ever alert for higher developments, the work of Mr. Alvan G. Clark, then the premier telescope maker of the

world, in the designing of an uncemented doublet photographic objective attracted their attention and he placed the production of his lens in their hands.

In 1890 occurred another very important advance in the association with the Carl Zeiss Optical Works, Jena, Germany, for the manufacture of their newly patented Anastigmatic photographic lenses. This series of lenses, originated by Drs. Abbe and Rudolph,



Bausch & Lomb's factory in 1880.

was at once patented in America and their manufacture delegated to the Company under a contract dated 1892 with sole right to manufacture these lenses in America. This association resulted in several members of the Company making a protracted stay at the Zeiss Works where they became familiar with the rigid systems of testing, the careful methods of working, and the high standards of workmanship required in the production of these lenses, which, when combined with the ingenuity of American workmen, has resulted in the production of the series of Bausch & Lomb-Zeiss Anastigmatic lenses.

Telescope objectives and eyepieces of limited size have been manufactured for many years, as have the objectives and eyepieces for surveying instruments and rifle telescopes.

Early in the development of the modern Navy of our country, and of the coast defense, the Government found it desirable to have a source of supply for search-light mirrors in this country.



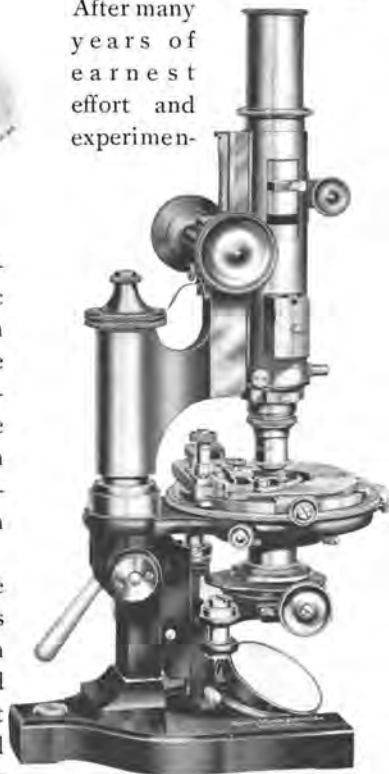
The first microscope.

tation along these lines, the Company was able to produce parabolic and Mangin search-light lenses, which were in every way acceptable to the Government, and to evolve a silvering process which has placed the search-light of the American Navy on a par in efficiency with the achievements of our Naval constructors in other lines.

It would be almost impossible to enumerate the multitude of lenses for every line of work ranging from small double convex lenses, turned out in vast quantities, to the most accurate lenses and prisms required by the Government for range finders

These immense lenses, ranging in size from 12 to 72 inches in diameter, were produced entirely in Europe, their production requiring very exacting mechanical work, enormous disks of perfectly tempered glass, and a silvering process which would withstand the terrific heat of the electric arc, which is placed in the focus of the mirror of the search-light.

After many years of earnest effort and experimen-



A 1903 type.

and surveying purposes. Millions upon millions of lenses for every purpose for which lenses are used, have been produced.

In 1893 the Zeiss Optical Works completed another optical invention of great practical value in the Zeiss Porro Prism Field Glass, an optical instrument requiring the highest degree of optical skill in its production. The American patents, as in the case of the Zeiss Anastigmat Photographic lenses, were placed in the hands of the Company, who have, since 1898, been producing the Bausch & Lomb-Zeiss Stereo Binoculars, being the first successful production of field glasses in America.



The first lens cutting machine invented by Mr. J. J. Bausch.

Mr. Lomb's two sons, Adolph and Henry C., having completed their studies here and spent several years of study abroad, devoting themselves particularly to higher mathematics and physics, now began to contribute the fruits of their investigations.

The superiority of the methods evolved in the manufacture of lenses for spectacles, eyeglasses, condensers, magnifiers, reading glasses, and for other purposes, soon created such a demand for American Standard lenses in preference to those of foreign make, that additional room for a new grinding plant was required and a large and substantial structure was laid out on the Vincent Street side of the premises.

Upon the completion of the building, the installation of the machinery began. This occupied considerable time, as the work of building the machines was all done in the Company's machine shops, as is all the designing and construction of special machinery, and the making of the multitude of fine tools required throughout the factory. The new grinding plant has a production of over 67,500 spectacle lenses a day, and in addition thousand of lenses for special purposes. In 1899 an entire new story was added to the old factory buildings to accommodate the growing industry, and in the following year a new story was placed upon the large Vincent Street building.

Meanwhile the extensive relations which had sprung up between the Company and the educational institutions of our land, by which the most advanced thought of the educational workers was directed toward the improvement of the microscopes, microtomes, and other laboratory apparatus which were being manufactured, demanded the

addition, as a convenience to their patrons, of supplies of Chemical Glassware, Chemicals, Stains, Microscopic Objects, Microscopical Tables, Cabinets, etc., until at the present time a large stock is required to be kept constantly on hand, and it has been necessary to build a special factory in Germany for the production of chemi-



Bausch & Lomb's factory in 1889.

cal glassware, in order that the supply be constant, uniform in quality, and of the most approved construction. The machinery for much of the delicate work in this factory was designed and built in the machine shops of the Rochester plant and embodies many original features which are readily seen in the quality of work being turned out in Germany.

The friendly relations which have, since the beginning of the manufacture of microscopes, existed between the Company and scientific workers in all parts of the country, have resulted in the manufacture of many kinds of apparatus which cannot be considered as strictly optical. The use of the microscope in the Bacteriological

Laboratory, as the importance of bacteriology became apparent, called for the supplying of incubators, sterilizers, autoclaves, etc.

The application of centrifugal force in the collection of urinary and other sediments and in the separation of blood elements for examination under the microscope, suggested the construction of a suitable centrifugal apparatus, propelled by hand, water, and electric power, and these also became part of the manufacture. So on

through the list. The growing business demanding still greater facilities, a new building was constructed on the north side of the main factory building. This structure was made fire-proof to accommodate those branches involving the most delicate processes. The lower portion of this building, which is excavated out of the solid rock, contains vaults for the storage of tons of the many varieties of optical glass required in the production of various kinds of optical instruments. The general sup-

Port of Medicine.
jes

WM. CARSON, Agent,
Rochester.

J. J. BAUSCH & CO.,
OPTICAL INSTITUTE, No. 20 Arcade,
(opp. the Post-office),
continue to keep on hand a large assortment of

SPECTACLES,
of every description, with glasses scientifically ground, and of the best material, suitable for long, short, or otherwise impaired sight.

Being in possession of the genuine **PASSER** (rock crystal) Lenses, which for their clearness, hardness, and beneficial results for vision, are acknowledged in America and Europe, as the best in use, and superior to any Glasses, from whatever place they may come—and having had much practical experience in Optical business, they can confidently assure the public, that they are able to suit any eyes, and to amend disordered vision as far as it can be done by glasses.

From the great number of our references, we only name the following justly and highly esteemed gentlemen and able judges:

C. Dewey, M. D., D. D.	W. W. Ely, M. D.
E. M. Moore, M. D.	H. W. Dana, M. D.
D. Barrows, M. D.	Th. Hall, M. D.
D. Ely, M. D.	W. W. Reid, M. D.
N. S. Barnes, M. D.	J. B. Walker, M. D., Oculist.

Rochester, April, 27, 1866.

An early newspaper advertisement recently discovered in the cushion of an old rocking chair.

plies for the various departments are also kept there.

One not well acquainted with the requirements of a modern large manufacturing establishment, would be surprised at the number and variety of the articles required to be kept in stock in this department. A trip through it would disclose stores of hardware, cloth, metals, brushes, boxes, papers, soaps, and articles too numerous to mention, sufficient to stock a large general store.

In the early stages of the business, Mr. Bausch gave his personal attention to the supervision of the work and inspection of the finished product, and as the manufactures increased this work devolved upon the younger members of the Company. The subsequent enlargement of the plant, with the increased producing power and larger number of workmen, made it impossible for them to adequately oversee all parts of the work-shop, and it was necessary to entrust their duties to others. This involved the development



of a system of supervision and inspection which in itself is a marvel of intricacy and perfect adaptation to the purpose for which it was devised. Each article, whether simple or complex, must not pass out of the establishment until it is fully up to the standard of quality established for it, as a defect, no matter how insignificant, whether in a special lens, a photographic objective, a searchlight, or in the optical performance of a microscope objective, will seriously affect the reputation of the Company. The constant aim is to reach a higher standard of excellence, to foster a spirit of higher attainment in the productive force, and to eliminate the possibility of the production of work defective in any way. With the mass of detail connected with the production of thousands of different parts, of many different kinds of material, for an infinite variety of purposes, the assembling of them, fitting them, until they form a complete whole, requires an inflexible system in the conduct of the work-shop, an untiring vigilance of inspection at every process, and an accumulation of skill in the workmen which must be complete in every detail, in order that every article turned out may be uniform in quality with every other.



Bausch & Lomb Mutual Benefit Association

Desiring to provide some temporary means of support for employees who are thrown out of employment through sickness, and to assist the families of deceased members, the Bausch & Lomb Optical Company Mutual Benefit Association was organized April 16, 1881.

Any person having been in the employ of the Company two month's time may become a member of the Association. The application of all applicants twenty years of age or over must be accompanied by a certificate of an examining physician. The funds of the Association consist of an original donation made by the Bausch & Lomb Optical Company, the monthly dues of members, and the fines collected by the Company from their employees. The monthly dues are divided into five classes, based on the amount of wages received and ranging from 50 cents per month for the first class to 5 cents per month for the fifth class, the benefits ranging

from \$8.00 per week for the first class to \$1.00 per week for the fifth class. These benefits are paid for a period not exceeding twenty-six weeks within one year from date of sickness.

By unanimous vote of the Board of Directors a greater benefit than regularly given may be granted in extreme cases.

Upon the death of a member of the Association, his heirs shall receive from \$100.00 for the first class to \$15.00 for the fifth class.



Bausch & Lomb's factory in 1903.

Since the establishment of the Society there has been paid out in benefits to its members, \$34,861.72. The average membership of the Society at the present time is about 930 members.

In addition to this benefit fund, there is a private fund maintained by Messrs. J. J. Bausch and Henry Lomb out of their private purses, and which is replenished by them from time to time for the purpose of taking care of special needy cases which do not come within the constitutional rights of the Mutual Benefit Association to provide for.

Bausch & Lomb Pension Fund

In 1900 a fund was established by Mr. J. J. Bausch, Mr. Henry Lomb and the Company, with a desire to assist in providing a comfortable future for employees who have served the Company many years.

The fund was materially increased by them on this anniversary.

Organization

The officers of the Company at the present time are J. J. Bausch, President; Edward Bausch, Vice-President; Henry Bausch, Vice-President; Henry Lomb, Treasurer; W. Drescher, Assistant Treasurer; Carl F. Lomb, Secretary; Wm. Bausch, Assistant Secretary.

DIRECTORS: J. J. Bausch, Henry Lomb, Edward Bausch, Henry Bausch, Carl F. Lomb, William Bausch, W. Drescher.

Branch Offices

The technical nature of the business and the necessity for coming in close contact with the trade, made it necessary to establish a series of branch offices, and in addition to the office opened in New York in 1866, and which is now in charge of Mr. Henry Fincke, an office was established in Chicago in 1896 under the management of Dr. Wm. H. Knap, and another office was opened in Boston in 1903 under the management of Mr. L. M. Potter. These offices are conducted largely as a convenience to the trade, as the Company has business relations with nearly every dealer in optical goods in America.

In 1902 a separate Company under the title of the Bausch & Lomb Optical Company, G. m. b. H., was organized in Germany. This office is at Frankfurt, a/m, under the management of Mr. August H. Lomb. This Company does a general merchandising business in chemical glassware and different kinds of scientific apparatus, as well as in the Bausch & Lomb Optical Company's products, selling both in Europe, and exporting to America. This Company also owns the glass factory for the manufacture of chemical glassware. The demand for Bausch & Lomb products abroad has made it necessary to establish depots in foreign countries where these products can be obtained. Accordingly an arrangement was entered into with responsible houses to carry a full line of their manufactures in Paris; Tokio, Japan; St. Petersburg, Russia; Barcelona, Spain;

London, England; City of Mexico; Toronto, Canada; Brisbane and Sidney, Australia; whereby a complete stock of the Bausch & Lomb photographic, microscope and field glass products, as well as eyeglasses and lenses of various kinds is available there.

In addition to these houses who carry complete stocks, and are therefore supply depots for the countries, the Company maintains trade relations with the leading houses dealing in optical goods everywhere.

While, as we have seen, the business of the Bausch & Lomb Optical Co., has grown from the humblest beginning imaginable to one of large proportions, from an unpromising and anything but prosperous enterprise, to a well established industry, every step of the way has been gained through the most strenuous effort, the severest application and the utmost attention to details, and even today these conditions are unrelaxed. However, in looking back over the record of facts in these fifty years of struggle, the things which most impress one who has not been through the turmoil, and who merely views the events as facts of history, are the innumerable difficulties which have been surmounted, and the tenacity and intensity of purpose to produce better articles than have ever been produced before, regardless of the sacrifices necessary in producing them, and the other purpose to produce every part under one roof, in order that its quality might be known and contribute to the production of a whole of known excellence, have been carried out, rather than the actual successes which have accompanied and grown out of these efforts.

What these successes are will be seen somewhat from the following statistics as well as from what has preceded. It is, however, proper as a matter of history to point out that the establishment in Rochester of this industry which has year after year trained the unskilled to be skilled optical workers, and which has made possible the production of various optical appliances requiring lenses, by producing the lenses in quantities sufficiently large and at prices sufficiently low to build up around it the other optical establishments which now make Rochester the optical center of the world.

Statistical

In order to give some idea of the nature and extent of operations at the present time the following facts have been collected. They represent only a few of the larger quantities and items.

Some Items of Equipment

- Six Boilers, 2,000 horse-power, smoke-consuming.
- One double engine, 750 horse-power.
- Five 20 horse-power engines.
- One 200 kilo-watt direct connected electric power generator.
- One 100 kilo-watt direct connected electric power generator.
- One 35 kilo-watt steam turbine electric power generator.
- One 15 ton ice machine.
- One 100 horse-power fire pump with complete fire system, including water storage reservoir.
- Ten steam pumps.
- Twenty-four electric motors from 5 to 50 horse-power each.
- Two hydraulic elevators.
- One power elevator.
- Switch-board of 5,000 volts capacity, connected with all electric power companies of Rochester, to be used in case of the generators becoming disabled.
- Forty electric stoves.
- Four separate hot-air heating and ventilating systems, delivering 80,000 cubic feet of pure outside air per *minute*, properly warmed, to the buildings.
- Forty-five miles of electrical wires.
- Two thousand incandescent electric lamps.
- One hundred and fifty arc lights.
- Eight miles of water and gas piping.
- Fifty long-distance telephone stations connected by thirty miles of wire, putting every department in connection with every other and with the outside telephone systems of the city by a private exchange.
- Ice water for drinking piped to every room.
- Thirty-six manufacturing departments, including such special branches as printing, wood-working and cabinet-making, leather case making, silvering, metal plating, gold working, draughting, machine and tool designing and building.

Seventy office clerks, correspondents, book-keepers, etc.

Twelve hundred employees.

Several hundred patents covering their own inventions, are owned by the Company, although the greater part of their inventions are not patented.

A Few Items of Consumption

600,000 lbs. of optical glass per year.	2,000 drills.
30,000 lbs. of crown and flint glass per year.	4,250,000 envelopes.
10,000 lead pencils per year.	50,000 lbs. of excelsior for packing.
10,000 steel pens.	2,500 files.
6,000 lbs. hard rubber.	35 gallons of writing ink.
7,750,000 screws.	215,000 matches.
10,000 bars of soap.	30,000 lbs. of brass tubing.
9,000 lbs. of soap powder.	110,000 lbs. of brass rod and sheet brass.
750 lbs. of dry sponges.	16,000 lbs. of lubricating oil.
300 miles of twine for wrapping packages.	52,000 lbs. of fuel oil.
150,000 lbs. of emery powder.	327,600,000 lbs. of water for manufacturing purposes, and in addition
1,800 gallons of wood alcohol.	82,560,000 lbs. of water evaporated into steam in the boilers.
2,000 lbs. of anhydrous ammonia for making ice.	22,080,000 lbs. of drinking water.
15,000 feet of belting.	1,200,000 cubic feet of gas are consumed per year for brazing, soldering and other manufacturing purposes.
450,000 paper boxes for packing lenses, shutters and other articles.	60,000 lbs. of paper.
60,000 wooden packing cases.	210,000 lbs. of iron castings.
400 brooms for sweeping floors.	30,000 lbs. of steel.
5,000 yards of toweling for wiping lenses, etc.	50,000 lbs. of brass castings.
10,200,000 lbs. of coal.	

Production

The productive capacity of the works for any one particular article can hardly be stated, as the arrangement is such that the working force and machinery can be put on almost any work for which there is a demand, the policy of the business being to produce of any article only what there is immediate need for. In the Lens Department, where the work is carried on continuously in one line, the production amounts to 20,250,000 spectacle lenses per year, besides the millions of special lenses.

It may be of interest to state, however, that in the Photographic Department there have been turned out over 10,000,000 simple lenses for photographic purposes, and over half a million

high grade photographic lenses, by which is meant Anastigmats, Rapid Universals, Portraits, Wide Angles, etc. There have also been produced over 550,000 photographic shutters during the comparatively few years in which shutters have been made. There have been manufactured and sold over 44,000 complete compound microscopes with objectives, eyepieces, nosepieces, accessories, etc., and over 10,500 $\frac{1}{12}$ -inch oil immersion objectives, as well as 4,000 microtomes. The following list shows the articles regularly manufactured, although there is so much special work constantly on hand that any list must be regarded as approximate only.

Abbe Substage Condensers.	Canada Balsam.
Achromatic Bank Note Detectors.	Centrifuges.
Achromatic Triplet Magnifiers.	Chemical Microscopes.
Alum Cells.	Clinostats.
Alvan G. Clark Photo. Lenses.	Coddington Magnifiers.
Animalcule Cages.	Colony Counters.
Mounting Apparatus.	Compensators.
Apparatus Clamps.	Compressors.
Attachable Mechanical Stages.	Condensing Lenses, for Magic Lanterns,
Attachable Microscope Stages.	Enlarging, etc.
Automatic Irrigators.	Coquille Lenses.
Automatic Photographic Shutters.	Convertible Anastigmat Lenses.
Automobile Head-Light Mirrors.	Convex and Concave Neutralizing
Antoclavs.	Disks.
Bausch & Lomb Prism Binocular Field	Cork Borers.
Glasses.	Cornea Lenses.
Bausch & Lomb-Zeiss Anastigmat	Cornet's Forceps.
Lenses.	Cosmorama Lenses.
Bausch & Lomb-Zeiss Planar Lenses.	Counting Cells.
Bausch & Lomb-Zeiss Protar Lenses.	Cover Glasses.
Bausch & Lomb-Zeiss Stereo Binocu-	Gover Class Gauges.
lar Field Glasses.	Compressors.
Bausch & Lomb-Zeiss Tessar Lenses.	Cross Hair Eyepieces.
Bausch & Lomb-Zeiss Unar Lenses.	Cylindrical Lenses for computing scales
Bertrand Lenses.	and typewriters.
Bertrand Quadrant Eyepieces.	Dehydrating Apparatus.
Bicycle Lamp Lenses.	Demonstration Lenses.
Blood Lancets.	Dissecting Sets.
Blood Tables.	Drawing Boards.
Bottles Engraved for Chemicals.	Electric Arc Projection Lamps and
Bruecke Lenses.	Photo-micrographic Cameras.
Bulls Eye Condensers.	Engravers' Glasses.
Bunsen Burners.	Eyeglass Frames in Vulcanite, Zylonite
Bureau of Animal Industry Compress-	and Tortoise Shell.
ors.	Eyeglass Material and Accessories.
Camera Lucidas.	Filar Micrometers.

Filter Pumps.
 Filter Racks.
 Filter Supports.
 Finder Lenses.
 Focusing Glasses.
 Focus Testers.
 Gem Shutters.
 Galvanometer Mirrors.
 Glass Cutters.
 Glass Plates.
 Glass Stirrers.
 Graphoscopes.
 Grind Stones for edging lenses.
 Gummed Labels.
 Gun-sight Lenses or Illuminators.
 Haematokrits.
 Hand Camera Telephotographic Lenses.
 Hastings' Triplet Magnifiers.
 Head Bands.
 Head Mirrors.
 Heliograph Mirrors.
 Iconoscopes.
 Illuminating Objectives.
 Imbedding Substances.
 Incubators.
 Injection Material.
 Injection Syringes.
 Inoculating Needles.
 Iris Diaphragms.
 Iris Diaphragm Shutters.
 Iron Tripods for laboratory use.
 Kinematograph Lenses.
 Kinetoscope Lenses.
 Knife Boxes and Cages.
 Koch's Burners.
 Lenses, Plano Convex and Concave,
 Double Convex and Concave, Peris-
 copic Convex and Concave and all
 sizes from 10 mm. to 400 mm. and
 all required foci.
 Lens Caps.
 Lens Cutters.
 Lens Drills.
 Lens Envelopes.
 Lens Boxes.
 Lens Surface Grinders and tools for
 same.
 Lenses for Flour Testers.
 Lenses for Mirrors.
 Linen Testers.
 Loring Ophthalmoscopes.
 Level Eyepieces.
 Level Objectives.
 Level Glasses.
 Maddox Multiple Grooves.
 Maddox Multiple Rods.
 Maddox Prisms.
 Maddox Rods.
 Magnifier Lenses.
 Marking Diamonds.
 Measuring Apparatus for Optical Lenses.
 Meniscus View Lenses.
 Microscope Cases.
 Microscope Condensers.
 Microscope Object Cabinets.
 Microscope Objectives, all powers.
 Microscopes, Compound.
 Microscopes, Demonstration.
 Microscopes, Dissecting.
 Microscopes, Horizontal.
 Microscopes, Petrographical.
 Microscopes, Portable.
 Microscopes, Simple.
 Microscopical Mounting Media.
 Microscopical Stains.
 Microscopical Tables.
 Microscopical Lamps.
 Microtomes.
 Migge's Blood Apparatus.
 Milk Testers.
 Motor Cycle Headlight Mirrors.
 Mounting Tables and Stands.
 Mounted Sets of Condenser Lenses for
 Enlarging, Magic Lanterns, etc.
 Nivellating Apparatus.
 Nosepieces.
 Object Slide Boxes.
 Ophthalmometers.
 Ophthalmoscope Mirrors.
 Optical Benches, with accessories.
 Optical Screw Drivers and parts for
 same.
 Opticians' Prescription Card Cabinets.
 Optometers.
 Panorama Lenses.
 Parabolic Illuminators.
 Paper Boxes for Lenses.
 Paraffin Baths.

Phorometers.
 Photographic Lenses.
 Photographic Prisms.
 Photographic Shutters.
 Photo-micrographic Objectives.
 Placido's Disks.
 Plane Mirrors, Concave Mirrors.
 Plant Presses.
 Plastigmat Lenses.
 Pocket Magnifiers, Vulcanite, Zylonite,
 Tortoise Shell and Nickel Cases.
 Polariscopes.
 Portrait Lenses.
 Printed Focus Numbers.
 Printed Prismometric Charts.
 Prisms Bars.
 Prisms Gauges.
 Prisms, Photographic, for process work.
 Prisms, Reflecting, Dispersing, of all
 angles and sizes.
 Projection Apparatus for the projection
 of Horizontal Objects.
 Projection Apparatus for regular and
 microscopical projection.
 Projection Lanterns for ordinary projec-
 tion.
 Projection Lenses.
 Projection Objectives.
 Protractors.
 Quartz Wedges.
 Quizzing Glasses.
 Racks and Pinions.
 Range Finder Eyepieces.
 Range Finder Objectives.
 Rapid Rectilinear Lenses.
 Rayfilters.
 Reagent Cases.
 Reading Glasses, round, square and
 oblong; all sizes, single lenses and
 semi-achromatic, mounted with
 nickel or gold plated rims, and
 ebonized wood, leather covered,
 ivory, amber-zylonite and pearl
 handles.
 Reading Glass Stands.
 Retinoscopes.
 Retinoscope Mirrors.
 Rheostats.
 Rimless Eyeglass Mountings in gold,
 gold filled, steel and German silver.
 Search-Light Doors.
 Search-Light Mirrors.
 Section Lifters.
 Selenites.
 Shooting Glasses.
 Silvered Lenses for Mirrors.
 Simplex Automatic Stereoscopic Shut-
 ters.
 Simplex Photographic Shutters.
 Single Achromatic View Lenses.
 Skiascopes.
 Spectacle Lenses of all kinds, including
 spherical, cylindrical, Prismatic and
 Toric types, both uncut, interchange-
 able and rimless, and made of white
 or tinted glass and also of rock
 crystal.
 Spectroscopic Eyepieces.
 Standard Eye Plates.
 Steam Launch Headlight Mirrors.
 Steel Gauges for sizing lenses.
 Stereoscope Lenses.
 Stereoscopic Shutters.
 Sterilizers.
 Strops and Hones for Microtome
 knives.
 Sunshade Glasses.
 Surveying and Compass Glasses.
 Telephotographic Lenses.
 Telescope Eyepieces.
 Telescope Objectives.
 Test Tube Racks.
 Throat Mirrors.
 Transit Eyepieces.
 Transit Objectives.
 Transpirometers.
 Trial Cases.
 Trichinascopes.
 Tripod Magnifiers.
 Turn Tables.
 Unicum Shutters.
 Universal Portrait Lenses.
 Volute Shutters.
 Veriner Glasses.
 Vertical Illuminators.
 Vertical Photo-micrographic Cameras.
 Victor Shutters.
 Vulcanite Disks.
 Vulcanite, Zylonite and Tortoise Shell
 trial rings.
 Ward's Eye Shades.
 Warming Tables.
 Water Baths.
 Water Sampling Apparatus.
 Wide Angle Lenses.

Publications

Manipulation of the Microscope, by Edward Bausch.

Use and Care of the Microscope, by Edward Bausch.

Use and Care of Bausch & Lomb Microtomes.

Manual of Centrifugal, Blood, Urinary and Sputum Analysis

Rules and Regulations for Employees.

Constitution of the Bausch & Lomb Optical Company Mutual Benefit Association.

Journal of Applied Microscopy and Laboratory Methods.

Catalogues

Microscopes, Objectives, and Microscopical Accessories.

Microtomes and Apparatus for Microtomy.

Photomicrographic Apparatus.

Projection Lanterns and Accessory Apparatus.

Bacteriological Apparatus.

General Laboratory Supplies, including Chemical, Physical, Physiological and Biological Apparatus.

Chemicals and Reagents.

Photographic Lenses, Shutters and Accessories.

Bausch & Lomb-Zeiss Stereo, and Bausch & Lomb Prism Binocular Field Glasses.

Bausch & Lomb Plastigmat Lenses.

Bausch & Lomb Photographic Shutters.

Mahomet and the Mountain. A story of the Tele-Photo.

Pocket Catalogue of Microscopes and Appliances.

*Afternoon with Plastigmat and Volute.

*Rayfiltergraphs.

*Bausch & Lomb Hand-Camera Telephoto.

*Plastigmat Pictures.

*Plastigmat Art.

Botanical and Entomological Supplies. Microscopic Objects.

Bausch & Lomb Quarter Century Photographic Competition.

Press Comments on Plastigmat f-6.8.

*Bausch & Lomb Optical Company's Diaphragm Shutter.

*Prize Contest inaugurated by Bausch & Lomb Optical Company, 1891.

*Rapid Universal Photographic Objectives.

*Eyeglasses.

Price-List of Lenses, Reading Glasses and Ophthalmological Apparatus.

Bausch & Lomb Magnifiers and Readers. Eyeglass Material.

Optical Machinery.

Berteling Standard Compound Optometer.

"The Verdict," a list of purchasers of Bausch & Lomb microscopes.

*Microscopical Gazetteer.

Practical Microscope.

Those marked (*) are out of print.

1853 1903
SEMI-CENTENNIAL
BAUSCH-LOMB OPTICAL CO.

LYCEUM THEATRE

JULY 24, 1903

ENTERTAINMENT

given under the direction
of Messrs. M. E. Wollf and
Frank McGlynn. Musical di-
rector, Mr. Adolf Dissenbach

PART I.

1. American Fantasia, *Victor Herbert*
Orchestra

2. OVERTURE, "Der Freischuetz," *C. M. v. Weber*
Orchestra

3. Address by Hon. Adolph J. Rodenbeck, Mayor

4. WALTZ, "The Blue Danube," *J. Strauss*
Orchestra

5. THE TOBINS — In their Musical Act

6. PRESS ELDRIDGE — The Great Monologue Artist

7. HARRIGAN — The Tramp Juggler

8. VOCAL SELECTION — "Not Mr. Dooley"
Mr. Frank McGlynn

Intermission

PART II.

1. SELECTION, "Lohengrin," *R. Wagner*

Orchestra

2. Address by Hon. William E. Werner

3. POTPOURRI, "Songs of the Fatherland,"

Orchestra

E. Andauer

4. "A MATRIMONIAL BLIZZARD"

One Act Farce by E. McWade

Members of Lyceum Theatre Stock Co.

CAST:

Dick Savage	Mrs. Dick Savage	Mr. Frank McGlynn
Robert Dyke	Mr. Richard Vivian	Miss Rose O'Byrne

Scene: Law Office of Robert Dyke

5. MISS MARIE DRESSLER

6. INTERMEZZO, "Hiawatha," *N. Moret*

Orchestra

7. JOHNSON, DAVENPORT AND LORELLA, Acrobats

8. "America," (Audience will please join in the singing)

Patriotic March,

M. Tobani

Orchestra

A m e r i c a

My country ! 'tis of thee
Sweet land of liberty,
Of thee I sing ;
Land where my fathers died !
Land of the pilgrims' pride !
From every mountain side
Let freedom ring !

My native country, thee —
Land of the noble free —
Thy name I love ;
I love thy rocks and rills,
Thy woods and templed hills ;
My heart with rapture thrills
Like that above.

Let music swell the breeze,
And ring from all the trees,
Sweet freedom's song ;
Let mortal tongues awake ;
Let all that breathe partake ;
Let rocks their silence break, —
The sound prolong.

